UC Merced's Storm water system qualifies for 2 LEED points in 2 different categories.

SS Credit 6.1 – Stormwater Management: Rate & Quantity

Requirements

If existing imperviousness is less than or equal to 50%, implement a stormwater management plan that prevents the post-development 1.5 year, 24 hour peak discharge rate from exceeding the pre-development 1.5 year, 24 hour peak discharge rate.

SS Credit 6.2 – Stormwater Management: Treatment

Requirements

Construct site stormwater treatment systems designed to remove 80% of the average annual post-development total suspended solids (TSS) and 40% of the average annual post-development total phosphorus (TP) based on the average annual loadings from all storms less than or equal to the 2-year/24-hour storm.

Total Phosphorus (TP) consists of organically bound phosphates, poly-phosphates and ortho-phosphates in stormwater, the majority of which originates from fertilizer application.

Total Suspended Solids (TSS) are particles or flocs that are too small or light to be removed from stormwater via gravity settling. Suspended solid concentrations are typically removed via filtration.

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SUSTAINABLE STORMWATER SYSTEM

The UC Merced site consists of two watershed areas, a north and south. The north is 41.5 acres and drains into the North Detention Pond, which is then later discharged into the Fairfield Canal. The south is 23.3 acres and its runoff flows into Little Lake.

Our storm drainage management system is designed to treat storm water runoff and specifically Total Suspended Solids (TSS) and Total Phosphorus (TP) from which these two areas comprise of four components: bio-swales, catch basins, hydraulic separators, and detention ponds in a treatment train. During a storm event, storm water runoff from the campus impervious areas (buildings, sidewalks, parking lots and other hardscapes) is routed to bio-swale area then to a storm drainage system. Bio-swale areas are shallow channels with its side slopes covered with vegetation, which can collect and convey runoff to downstream discharge points such as catch basins. As runoff flows through the vegetation of the bio-swale, it reduces the velocity of the storm water runoff, allowing some percolation and filtration to take place.

After the storm water runoff travels through bio-swale areas it enters a typical storm drainage system, consisting of inlets, catch basins, area drains and piping for conveyance. The system uses inlets as part of the treatment train to trap the largest particles that might enter the downstream system. So Typically, sediments that do not pass through a No. 4 sieve as well as large floatables, are trapped at the inlet. Storm water is conveyed downstream through a system of piping that is terminated at the Continuous Deflective Separation (CDS) unit. The CDS unit is sized to treat the first flush of storm run-off from the site and by-pass storm run-off flow rates that are higher.

The CDS unit routes storm run-off through a separation chamber with a cylindrical screen. A natural vortex is formed and the high velocities push out the suspended solids in the chamber. The sediment then settles into a sump while floatable particles remain in the separation chamber. The unit will capture 95% of solid particles down to those passing a No. 10 Seive and 100% of floatable materials that flow through the unit.

After the CDS units run-off is conveyed into one of the two detention ponds, as outlined in the calculations provided for LEED 6.1, the maximum storage requirements for a 1.5-year storm event of 17,077 cf and 33,216 cf versus the pond capacities of 226,485 cf and 105,120 cf indicate the ponds were sized to allow sufficient detention time for fine particles to settle out thereby reducing TSS and TP.

Each component train has been designed in accordance with EPA and California Best Management Practice (BMP) standards and when used in this manner will remove 80% TSS and 40% TP.